Claims

1. Process for the detection, cloning and/or sequencing of polypeptides or parts thereof, which drive the subcellular localization of a protein containing such polypeptide or part thereof,
characterized in that the process comprises the following steps:
(a) constructing an expression library of random nucleic acids ligated to a reporter gene and contained in a vector molecule,
(b) transfecting a plurality of host cells with the library,
(c) screening for the subcellular localization of the expression product of the nucleic acid in the host cells via detection of a signal produced by the reporter gene,
(d) cloning such cells where the reporter gene signal is detected in a certain subcellular localization, and
(e) cloning and optionally sequencing the nucleic acid insert which encodes the polypeptide or part thereof.

2. Process according to claim 1,
characterized in that a cDNA or cDNA fragments are used as random nucleic acids.

3. Process according to claim 1 or 2,
characterized in that a eukaryotic or a yeast library is used.

4. Process according to anyone of claims 1 to 3,
characterized in that a homologous system of library and cells for the transfection is used.

5. Process according to anyone of claims 1 to 3,
characterized in that a heterologous system of library and cells for the transfection is used.

6. Process according to claim 5,
characterized in that a Drosophila library is used to transfect mammalian or yeast cells.

SUB A2

7. Process according to anyone of claims 1 to 6,
characterized in that a reporter gene leading to a visually detectable signal upon expression is used.

8. Process according to claim 7,
characterized in that nucleic acids coding for GFP, BFP, luciferase or YFP are used as reporter gene.

9. Process according to anyone of claims 1 to 8,
characterized in that the vector contains an inducible promoter driving the expression of random nucleic acid and marker gene.

SUB A3

10. Process for the identification and/or production of a protein that is localized in a given subcellular localization,
characterized in that a nucleic acid coding for a polypeptide or part thereof driving the localization in said given subcellular localization is cloned according to claims 1 to 9 and the nucleic acid is used to detect DNA sequences coding for a protein containing such polypeptide or part thereof.

11. Process according to claim 10,
characterized in that for the production of the protein the nucleic acid is expressed in an expression system.

SUB A4

12. Process for directing the subcellular localization of a nucleic acid expression product,
characterized in that a polypeptide driving the localization of a protein containing such polypeptide or part thereof is detected, its nucleic

SUB A4 CONT.

acid sequence is obtained by a process according to anyone of claims 1 to 8, the nucleic acid coding for the polypeptide or part thereof is fused to a nucleic acid coding for a protein to be expressed, and the fusion product is expressed.

13. Process according to claim 12,
characterized in that a nucleic acid coding for the polypeptide or part thereof and a reporter gene is fused to the nucleic acid coding for a protein to be expressed.

14. Process according to claim 12,
characterized in that a reporter gene the expression product of which is visually detectable is used.

15. Process according to anyone of claims 12 to 14,
characterized in that the fusion product contains a proteolytic cleavage site between the protein to be expressed and the polypeptide or part thereof and/or reporter gene product.

SUB A5

16. Vector for the expression of a desired protein wherein the vector contains a specific site into which a DNA encoding said desired protein can be inserted,
characterized in that the vector further comprises a DNA sequence encoding a polypeptide or a part thereof which drives the subcellular localization of a protein containing such polypeptide or part thereof, which DNA sequence is positioned in such a way that a fusion protein of desired protein and polypeptide or part thereof is encoded.

17. Vector according to claim 16,
characterized in that the vector is a eucaryotic vector.

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18. Vector according to claim 16 or 17,

SUB A6 CONT.

characterized in that the vector further comprises a reporter gene positioned in such a way that a fusion protein of desired protein and polypeptide or part thereof and reporter gene product is encoded.

19. Vector according to claim 18,
characterized in that the reporter gene product is visually detectable.

20. Vector according to anyoner of claims 16 to 19,
characterized in that the vector further contains sequences encoding proteolytic cleavage sites between one or more of the constituents of the fusion protein.

SUB A7

21. Cell line,
characterized in that it is transfected with a vector according to anyone of claims 16 to 20, encoding a fusion protein of at least a polypeptide or part thereof driving the localisation to a given subcellular localisation and a desired protein.

22. Kit for the expression of a desired protein in a desired localisation of a host cell,
characterized in that it contains a vector according to anyone of claims 16 to 20 or a cell line according to claim 21 optionally together with other components and/or buffers for the protein expression.

23. Collection of cell lines according to claim 21.

ADD A8